
USER'S MANUAL

Digital Multimeter
DMR-1100A

CIRCUIT-TEST ELECTRONICS
www.circuittest.com

INTRODUCTION

Your Circuit-Test DMR-1100A Digital Multimeter incorporates the latest technology to provide you with a feature packed instrument. With it you can measure a wide range of voltages, current and resistance in the lab, shop, car and home. This product has been designed for the electrician, technician and hobbyist.

SAFETY INFORMATION

This meter conforms to IEC-61010 for Category I 600V and pollution degree 2. This meter is designed for indoor use only and proper guidelines must be followed for personal and product safety. Per IEC1010 over installation category, equipment of overvoltage Category I is equipment for connection to circuits in which measures are taken to limit the transient overvoltages to an appropriate low level. Examples include protected electronic circuits. Note: Do not use this meter for measurements within overvoltage Category II, III and IV.

SAFETY SYMBOLS



This symbol adjacent to another symbol, terminal or operating device indicates that the operator must refer to an explanation in the Operating Instructions to avoid personal injury or damage to the meter.



This symbol adjacent to one or more terminals identifies them as being associated with ranges that may, in normal use, be subjected to particularly hazardous voltages. For maximum safety, the meter and its test leads should not be handled when these terminals are energized.



This symbol advises the user that the terminal(s) so marked must not be connected to a circuit point at which the voltage with respect to earth ground exceeds (in this case) 600 VAC or VDC.

WARNING

1. Set the function switch correctly before making any measurements.
2. Do not operate the unit unless the case is completely closed.
3. Disconnect test leads from equipment before removing the battery.
4. Never connect unit to AC or DC powered circuits when function switch is set to Ω , diode check or continuity.
5. To safeguard against electrical shock or damage to instrument, never connect to more than 600V DC or 600V AC between input jacks and ground.
6. Always inspect the instrument, test leads and other accessories for damage prior to use.
7. Read this instruction manual carefully and completely before using.

SAFETY PRECAUTIONS

High voltage AC and DC circuits are dangerous. Always consider circuits to be energized. Never assume any equipment is de-energized. Lack of caution or poor safety practices can be very dangerous and/or lethal.

FEATURES

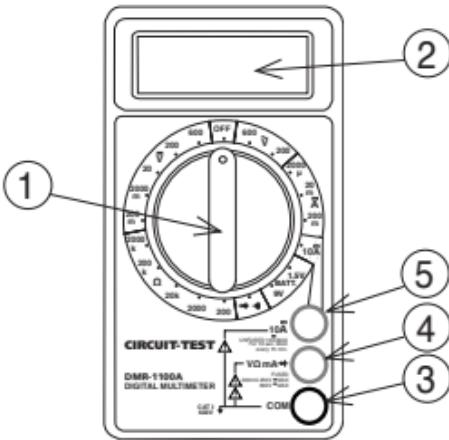
Diode Check - test diodes and other semiconductors for open and short circuits.

Overload Protection - protects the meter from overvoltage.

Auto-Polarity - indication on display that polarity is reversed.

Battery Test - 1.5V and 9V batteries.

FRONT PANEL



1. Function Switch - Select desired function and range and to turn the meter ON and OFF.
2. LCD Display - 3 ½ Digit
3. COM Jack - Plug-in terminal for black test lead
4. VΩmA→ Jack - Plug-in terminal for red test lead, for all measurements except DC current measurement $\geq 200\text{mA}$.
5. 10A Jack - Plug-in terminal for red test lead for DC current measurement between 200mA to 10A. Note: There is no fuse protection for this jack input.

SPECIFICATIONS

a. GENERAL

Display:	3.5 digit, 0.5" (12mm) H LCD
Ranging:	Manual ranging
Polarity:	Automatic, minus (-) sign indicates negative polarity
Over range:	"1" is displayed
Low Battery:	"  " or "BAT" indicates low battery
Input Impedance:	1M Ω (DCV/ACV)
Sampling Rate:	About 2 to 3 times/sec.
Operation Temp.:	0 to 40°C
Storage Temp.:	-10 to 50°C
Fuse:	GMA 250mA/250V
Power Source:	1 - 9V Battery
Dimensions:	70(W) x 127(H) x 25(D)mm
Weight:	170g (including battery)

b. TECHNICAL

Note: Accuracy is stated at 65°F to 83°F (18°C to 28°C) and less than 75% RH.

Accuracy is:

$$\pm ([\% \text{ of reading}] + [\text{Number of least significant digits}])$$

DC VOLTAGE

RANGE	RESOLUTION	ACCURACY
200mV	100 μ V	$\pm (0.5\% + 5)$
2000mV	1mV	
20V	10mV	$\pm (0.8\% + 5)$
200V	100mV	
600V	1V	$\pm (1.0\% + 5)$

Input Impedance: 1M Ω

Max. Allowable Input Voltage: 600V DC/AC rms

AC VOLTAGE

RANGE	RESOLUTION	ACCURACY
200V	100mV	
600V	1V	$\pm (1.2\% + 10)$

Input Impedance: 1M Ω

Frequency Response: 45Hz - 400Hz

Max. Allowable Input Voltage: 600V AC rms

DC CURRENT

RANGE	RESOLUTION	ACCURACY
2000 μ A	1 μ A	$\pm (1.0\% + 5)$
20mA	10 μ A	
200mA	100 μ A	$\pm (1.2\% + 5)$
10A	10mA	$\pm (2.0\% + 5)$

Overload Protection:

Fuse, 250mA/250V, Fast (for the "VΩ→mA" terminal's inputs only)

There is no fuse protection for the "10A" terminal's inputs.

Max. Allowable Input Current: 10A

(For inputs > 2A : measurement duration < 10 secs, interval > 15 minutes)

RESISTANCE

RANGE	RESOLUTION	ACCURACY
200Ω	0.1Ω	$\pm (1.2\% + 5)$
2000Ω	1Ω	
20kΩ	10Ω	$\pm (1.0\% + 5)$
200kΩ	100Ω	
2000kΩ	1kΩ	$\pm (1.2\% + 5)$

Max. Open Circuit Voltage: about 3V

DIODE AND CONTINUITY

RANGE	DESCRIPTION
	Test Voltage: about 2.8V Test Current: about 1mA The approximate forward voltage drop in mV will be displayed.
	The built-in buzzer will sound when the resistance is less than about 50Ω

BATTERY TEST

RANGE	DESCRIPTION	TEST CONDITION
1.5V	The working voltage of the battery will be displayed on the LCD.	The working current is about 20mA.
9V		The working current is about 5mA.

MEASUREMENTS

Please take a few minutes to read these instructions prior to use.

1 DC VOLTAGE MEASUREMENT

⚠ WARNING: Maximum input is 600V DC.

- 1-1 Plug the red test lead into the V jack and the black test lead into the COM jack.
- 1-2 Set the range switch to the desired $\overline{\overline{V}}$ position. It is best to start with the highest range if the voltage is not known.
- 1-3 Attach the test leads to the circuit to be measured. Ensure that the black lead is connected to the negative side of the circuit and the red lead to the positive.
- 1-4 Read the displayed voltage.
- 1-5 If the minus(-) sign appears the voltage is negative at the point being measured.

2 AC VOLTAGE MEASUREMENT

⚠ WARNING: Maximum input is 600V AC.

- 2-1 Plug the red test lead into the V jack and the black test lead into the COM jack.
- 2-2 Set the range switch to the desired \tilde{V} position. It is best to start with the highest range if the voltage is not known.
- 2-3 Attach the test leads to the circuit to be measured.
- 2-4 Read the displayed voltage.

3 RESISTANCE MEASUREMENT

⚠ WARNING: Remove all power from the circuit being tested when checking resistance. Discharge any charged capacitors. Never connect the probes to any voltage while the selector is set to OHM.

- 3-1 Plug the red test lead into the V jack and the black test lead into the COM jack.
- 3-2 Set the range switch to the desired Ω position. If the resistance is not known, set the switch to highest range and reduce until a satisfactory reading is obtained.
- 3-3 Attach the test leads to the circuit.
- 3-4 Read the displayed resistance.

NOTE: For measurements $> 1M\ \Omega$ the meter may take a few seconds to stabilize reading. This is normal for high resistance measurements. When input is not connected, i.e. open circuit, "1" will be displayed to indicate over range.

4 DC CURRENT MEASUREMENT

⚠ WARNING: Remove all power from the circuit being tested when checking current. When using 10A scale, do not connect to circuit for more than 10 seconds.

- 4-1 Plug the red test lead into the mA jack and the black test lead into the COM jack if the current to be measured is less than 200mA. Insert the red test lead into the 10A jack if current being measured is between 200mA and 10A.

4-2 Set the range switch to one of the $\overline{\text{A}}$ current ranges. If you are unsure of the amount of current being measured set switch to the highest reading and reduce until a satisfactory reading is obtained.

4-3 Remove power from the circuit that is to be measured. Open up the circuit and connect the black lead to the negative side and the red lead to the positive side of the circuit so that the test leads are in series with the load to be measured.

4-4 Apply power to the circuit.

4-5 Read the displayed current.

NOTE: If changing range switch to or from the 10A position first disconnect power and test leads from the circuit being tested. Repeat the above steps using the correct input jack and range switch position.

5 DIODE TEST

⚠ WARNING: Remove all power from the circuit being tested when using the diode check. Discharge any charged capacitors. Never connect the probes to any voltage while the selector is set to \rightarrow .

5-1 Plug the red test lead into the V jack and the black test lead into the COM jack.

5-2 Set the function switch to \rightarrow .

- 5-3 Connect the red test lead to the anode and the black test lead to the cathode of the diode to be tested.
- 5-4 The approximate forward voltage drop of the diode will be displayed in mV. If the connection is reversed "1" will be displayed.

6 CONTINUITY TEST

⚠ WARNING: Remove all power from the circuit being tested when checking continuity. Discharge any charged capacitors. Never connect the probes to any voltage while the selector is set to $\cdot\cdot\cdot$.

- 6-1 Plug the black test lead into the COM jack and red test lead into the V jack
- 6-2 Set the function switch to $\cdot\cdot\cdot$.
- 6-3 Connect the probes across the circuit to be measured.
- 6-4 If the resistance is lower than about 50Ω , the buzzer will sound.

7 BATTERY TEST

- 7-1 Plug the black test lead into the COM jack and red test lead into the V jack
- 7-2 Set the function switch to desired BATT range position (1.5V or 9V).
- 7-3 Connect the test leads to the two terminals of the battery to be measured and note the reading.

Battery	Good	Weak	Bad
9V	> 8.2V	7.2 to 8.2V	< 7.2V
1.5V	> 1.35V	1.22 to 1.35V	< 1.22V

MAINTENANCE

1 BATTERY REPLACEMENT

⚠ WARNING: Disconnect both test leads from any equipment before removing back cover. Do not use the meter with the case opened.

- 1-1 Disconnect both test leads and turn off the power.
- 1-2 Remove the screws in the rear cover of the case and remove the cover.
- 1-3 Unsnap the battery from the connector and replace with a new 9V battery.
- 1-4 Replace the cover and cover screws.

2 FUSE REPLACEMENT

⚠ WARNING: Disconnect both test leads from any equipment before removing back cover. Do not use the meter with the case opened.

- 2-1 Disconnect both test leads and turn off the power.
- 2-2 Remove the screws in the rear cover of the case and remove the cover.

- 2-3 Replace the blown fuse with a GMA 250mA/250V fuse.
Do not use a fuse which has a higher rated value than specified or try to bypass the fuse.
- 2-4 Replace the cover and cover screws.

LIMITED WARRANTY

Circuit-Test Electronics warrants to the original purchaser that this product be free of defect in material or workmanship for a period of 2 years from the date of purchase.

Any product which has been subjected to misuse or accidental damage is excluded from the warranty. Except as stated above, Circuit-Test Electronics makes no promises or warranties either expressed or implied including warranties of merchantability or the fitness for any particular purpose.